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Implementing Energy Routing Protocol for Optimization of Power Consumption in MANET

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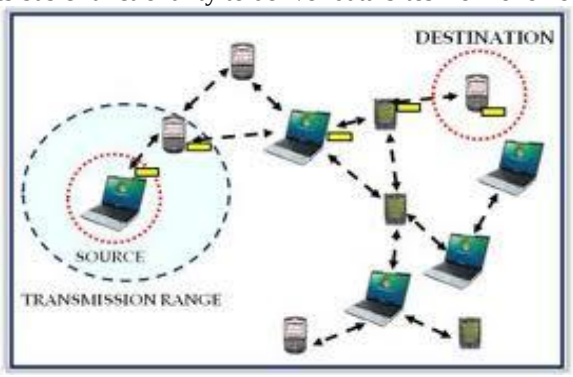
Abstract—The present days technology rapidly increases mobility capabilities have become readily available to devises. Mobile ad hoc networks (MANETs) are being developed to perform a number of important tasks. In MANETs power conservation is a critical issue to improve the communication energy capability at individual nodes because the energy resources are limited at the electronic devices(Nodes), since each node in a wireless add hoc network operate on battery power and battery energy is a rare resource. The less of energy In nodes can effects the communication activate in networks. This paper evaluates three ad hoc networks routing protocol (EPAR, DSR and MTPR) in different network parameter taking into considering the power consumption. Indeed our proposed scheme implementation of EPAR protocol while achieving QoS metrics like PDR, Throughput, Jitter, Delay etc. Along with the optimization of energy consumption.

Keywords—MANETs, EPAR, MTPR,DSR, PDR.

I. INTRODUCTION

MANET (Mobile Ad hoc Network) is a new emerging technology which enables users to communicate with out any physical infrastructure regardless of their geographical location. It is self organizing and adaptive also the devices to maintain connections to the network. MANET is not required any fixed infrastructure, that network all nodes dynamically and arbitrarily located and required to relay packets to other nodes in order to deliver the data across the network. MANET production of its basic functionality to deliver data bites from one node to another.



Structure of MANETs

How MANET works?

The MANETs are organize in an ad hoc manner where terminal nodes are capable of establishing connections by themselves and communicate with each other in a multi hop manner without the helf of fixed infrastructure. This infrastructure property makes an add hoc networks be quickly deployed in a given area an provides robust operation.

The communication is become very important for transferring information between to host from anywhere. MANET is a group of nodes that form a network individually of any centralized administration In the MANETs can establishing the network between the nodes by using protocols it can be categorized based on their working process .This protocols divided into two types reactive and proactive protocols. This protocols can be used in the MANET solves the problems allowing unremitting parties to reliable data transmissions. This is archfiend by dividing MANET into two types of networks, they are single and multiple hop. In a single hop network, all nodes communication directly each other, done by within the same radio region. in a multiple hop network, nodes depends on other unmitigated nodes to transmit if the receiver node is out of their radio region. MANET is used for exchanging information between sender to receiver and nodes act as both transmitter and receiver, nodes may be mobile each node is willing to forward data to other noes communication can be Direct or Indirect otherwise rely on neighbors(indirectly). MANETs have no fixed infrastructure self configuring ability dynamic topology decentralized network routes between nodes may contain multiple hop nodes act as routers to forward packets for each other node mobility may cause the routes change.

Holding these unique characterizations, MANET is becoming more and more wisely emolument in the industries. However, considering the fact that MANET is more popular among crackle mission applications, network security is of more importance. MANET can supports tactical network for military communications and automated battle field. It provides disaster recover means replacement of fixed infrastructure network in case of environmental disaster to the network for the exchange of data between mobile devises. The devise network supports the wireless connection between various mobiles devise so that they can communicate. It is also allows us to share the Internet with other mobiles an capability of sensing like sensor network combines the power of three they are smoke detectors, electricity, gas and water meters

II. SYSTEM ANALYSIS EXISTING SYSTEM

Mobile nodes in MANET are battery driven they suffer from limited energy level and link breakage problems they are node dying of energy exhaustions and node moving out of the radio range of its neighboring nodes. It can be using the efficient protocols like EPAR is used to identifies the capacity of a node not just by its residual battery power , but also by the expected energy spent in reliably forwarding data packets over a specific link and also using a minimax formulation by selects the path that has the largest packet capacity at the smallest residual packet transmission capacity. This protocol must be able to handle high mobility of the nodes that often cause changes in the network topology. The other majority of energy efficient routing protocols for MANET try to reduce energy consumption by means of an energy efficient routing metric instead of minimum-hop metric is MTPR is a first approach for energy efficiency routing is known as minimum transmission power routing it uses a simple energy metric represented by the total energy consumed to forward the information along the route and reduces the overall transmission power consumed per packet but does not directly effect the life time of each node. The Dynamic source routing(DSR) does not support multi casting. It consists of all the intermediate route address along with source and destination and it sends route reply packets through all routes from where the request packets came, this leads to stale cache entries particularly in high mobility.

DISADVANTAGES OF EXISTING SYSTEM:

The findings show that the energy consumption and throughput in small size networks did not reveal any significant differences.

However for medium and large ad hoc networks the DSR performance proved to be inefficient in this study.

III. PROPOSED SYSTEM

Implementation of EPAR protocol while achieving good QoS metrics like PDR , Throughput, jitter, Delay etc, along with the optimization of energy consumption.

ADVANTAGES OF PROPOSED SYSTEM:

Our proposed system is implemented EPAR protocol to handle the optimization of power consumption and also achieving other remaining QoS metrics like PDR, Throughput, Jitter, Delay etc . In all the scenarios and all size of networks.

MODULES:

Route discovery :

In order to send data from source to destination node first identify the route after the identification of route then select best route to communicate.

Route Establishment:

Once the route was Discovered , then establish the best route must be loop free and it can control the multi-path when transferring data from source to destination. EPAR path is chosen based on energy path can be selected with maximum lowest hop energy. The EPAR algorithm is an on demand source routing protocol that uses battery life time prediction.

Data packet Format in EPAR:

Pt value must be the power that packet is actually transmitted on the link, any reason a node chooses to change the transmit power for hop I, it must set the value Pt (MTP[i]). The power differs by more then Mthresh then the link flag is set. Table : Data packet format in modified EPAR

Data Transfer:

The route establishment was completed then transfer the data packets from source to destination also maintains records to know about how many packets send ,receive and dropped.

IV. NETWORK METRICS

Remaining battery power

remaining battery power $\tau i = Pi / ri$ and Ti an estimate of the remaining battery life $\tau i = Pi / ri$ and $ui = u(Ti)$

Power Consumption:

power consumption is mainly due to transmission and reception of data packet , it refers to the power spent in calculation that take place in the nodes for routing and other decisions.

Dropped packets:

The fraction of dropped packets increases as the trafic intensity increases the performance at a node is measured also in terms of the probability of dropped packets, its may be transmitted on an end to end basis.

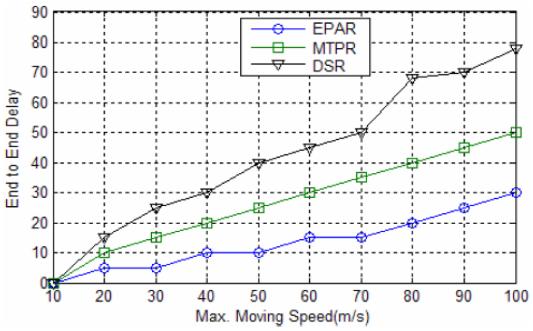
Network Lifetime:

If the battery power is high in all the mobile nodes in the MANET network lifetime is increased, it is the time span from the deployment to the instant.

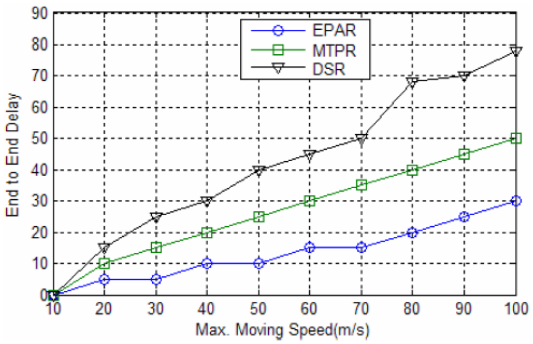
V. SIMULATION SETUP

Simulation conducted using NS-2.33. The simulation network consider of 120 nodes randomly scattered in a 2000x2000m area at the beginning of the simulation nodes are moving speed range between 0 to 10m/s and uniform pause time of 10s. The simulation parameter

No of nodes	120
Area size	2000x2000
Mobility model	Random way point
Traffic type	CBR
Channel capacity	2Mbps
Transmit power	0.5J
Receiver power	0.1j
Idle Power	0.01J
Initial Energy	7.1J
Communication system	MAC/IEEE 802.11G power
Routing Protocol	DSR, EPAR, MTPR



End to end delay v/s pause time (moving speed).



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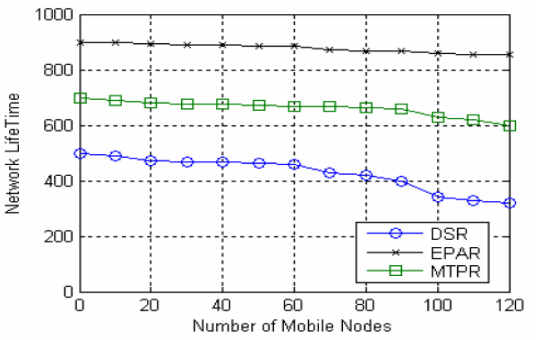
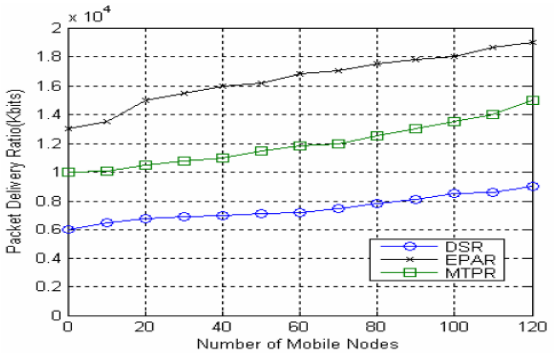
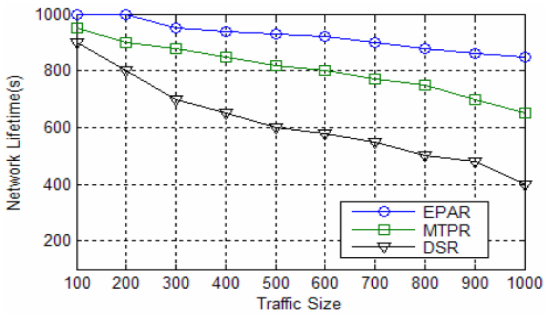


Lifetime as the function of the number of nodes.



Number of nodes versus throughput for 120 nodes.



N/W lifetime varying with respect network size

ROUTE DISCOVERY

VI. CONCLUSION

We proposed an original solution EPAR is basically an improvement on DSR and medium and large ad hoc networks the EPAR & MTPR product good results in particular the performance of EPAR good in small size networks compare to DSR in QoS metrics like PDR and energy consumption. The overall study performance of EPAR is good all other QoS metrics in all scenarios.

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